- **Board of Directors**
  Engineering and Capital Programs Committee

December 9, 2008 Board Meeting

7-4

Subject

Appropriate $105,000; and authorize seismic study of the Upper Feeder's Santa Ana River Bridge (Approp. 15441)

Description

This action authorizes a seismic study of the Santa Ana River Bridge, which supports a segment of the Upper Feeder. This study is categorized as an Infrastructure Rehabilitation project and is budgeted within Metropolitan's Capital Investment Plan (CIP). This project has been reviewed with Metropolitan's updated CIP prioritization criteria and staff recommends moving forward at this time due to the critical nature of this facility.

Background

The Upper Feeder was constructed in 1936 as part of Metropolitan's original backbone distribution system. It extends approximately 60 miles west from Lake Mathews to the Eagle Rock Control Facility in the city of Los Angeles. The feeder conveys untreated water from Lake Mathews to the Weymouth plant, and then delivers treated water to Three Valleys Municipal Water District, Foothill Municipal Water District, and the cities of Pasadena and San Marino. Within Riverside County, the 9.67-foot-diameter welded-steel Upper Feeder is supported by a bridge that spans the Santa Ana River. Metropolitan's Santa Ana River Bridge is a 1,010-foot-long, 20-foot-wide steel truss bridge that is supported by 11 reinforced concrete piers that vary in height from 40 feet to 100 feet. The bridge was constructed in accordance with design standards and engineering practices of the 1930s. Since that time, significant advancements have been achieved in predicting the response and performance of structures as a result of strong earthquake shaking.

Santa Ana River Bridge Seismic Retrofit – Study ($105,000)

In the early 1980s, Metropolian initiated a seismic assessment of the conveyance and distribution system to determine which structures could be damaged in the event of a major earthquake. The Santa Ana River Bridge was evaluated, with a conclusion that seismic upgrades were needed. A conventional seismic retrofit of the bridge was determined to be cost-prohibitive, at that time. In 1985, the bridge was retrofitted with a base isolation system. This technology was considered relatively inexpensive and had been used successfully in many countries. The base isolation system is comprised of lead-core rubber bearings surrounded by layers of steel plates, with a layer of rubber between adjacent plates that sit between the bridge piers and the deck. During an earthquake, the bridge piers would experience seismic loads, while the base isolators would act as rollers to diminish the seismic shaking on the bridge deck and pipeline.

In late 2007, Metropolitan staff performed a structural inspection of the Santa Ana River Bridge and found that the base isolation system has reached the end of its useful life and needs replacement or modification. This inspection revealed that the bridge's steel members have begun to corrode and that the base isolators have experienced deterioration from exposure to the elements. A subsequent review of the base isolation system's design identified that although the retrofit was based on appropriate seismic criteria current at that time, the design would be significantly more robust if it followed today's seismic criteria. Staff recommends that an up-to-date seismic study be conducted for the Santa Ana River Bridge. A failure of the bridge could result in a shutdown of the Upper Feeder for up to 6 months due to the unique challenges of repairing a bridge and pipeline located 100 feet above the Santa Ana River.

The Upper Feeder pipe itself is in satisfactory condition, with the exception of an expansion joint that is located within the bridge span that leaks approximately three gallons per minute. The expansion joint accommodates length changes caused by thermal expansion or contraction of the pipeline. The expansion joint has deformed, which may have been caused by misalignment of the pipeline when the Santa Ana River Bridge was originally retrofitted, or possibly by deterioration of the expansion joint's interior walls. The leaking pipe section is contributing to the corrosion and deterioration of the bridge and needs to be addressed when considering seismic retrofit options.

The detailed seismic study will evaluate options to upgrade the bridge, including: replacement of the base isolators with an upgraded isolation system; adding dampeners to an upgraded base isolation system; elimination of the isolation system and strengthening the bridge, piers and deck; and replacement of the bridge-supported pipeline with a buried pipeline.

This action appropriates $105,000 and authorizes a seismic study of the Upper Feeder's Santa Ana River Bridge. All activities will be performed by Metropolitan staff, with specialized technical support from a geotechnical consultant. Metropolitan will perform the technical analyses, develop a budgetary cost estimate of repairs, and establish a preliminary project schedule. Staff will return to the Board at a later date for authorization to perform preliminary design, based on the preferred option identified in the study. This project has been evaluated and recommended by Metropolitan's CIP Evaluation Team, and funds have been included within the fiscal year 2008/09 capital budget.

This project is consistent with Metropolitan's goals for sustainability by enhancing the reliability of the existing conveyance and distribution system in order to maintain reliable water deliveries in the future. See **Attachment 1** for the financial statements and **Attachment 2** for the location map and photos.

Project Milestone

March 2009 – Complete study

Policy

Metropolitan Water District Administrative Code Section 5108: Appropriations

California Environmental Quality Act (CEQA)

CEQA determination for Staff Recommendation:

The proposed action is categorically exempt under the provisions of CEQA and the State CEQA Guidelines. The overall activities involve the funding, studying, carrying out preliminary design, and preparing and processing environmental documentation for the proposed action. These activities consist of basic data collection and resource evaluation activities that do not result in a serious or major disturbance to an environmental resource. This may be strictly for information gathering purposes, or as part of a study leading to an action, which a public agency has not yet approved, adopted, or funded. In addition, the activities may involve a check for performance of an operation, or quality, health, or safety of a project. Accordingly, the proposed action qualifies for both Class 6 and Class 9 Categorical Exemptions (Sections 15306 and 15309 of the State CEQA Guidelines).

The CEQA determination is: Determine that pursuant to CEQA, the proposed action qualifies under two Categorical Exemptions (Class 6, Section 15306 and Class 9, Section 15309 of the State CEQA Guidelines).

Staff Recommendation

Adopt the CEQA determination and

a. Appropriate $105,000; and
b. Authorize a seismic study of the Santa Ana River Bridge.

Fiscal Impact: $105,000 of budgeted funds under Approp. 15441

Business Analysis: This project will protect Metropolitan's assets, increase service reliability to customers, and reduce the risk of costly emergency repairs.

11/17/2008
Roy L. Wolfe *Date*
Manager, Corporate Resources

11/20/2008
Debra C. Man *Date*
for Jeffrey Kightlinger
General Manager

Attachment 1 – Financial Statement

Attachment 2 – Location Map and Photo

BLA #6304

Financial Statement for Conveyance and Distribution System Rehabilitation Program – Phase II

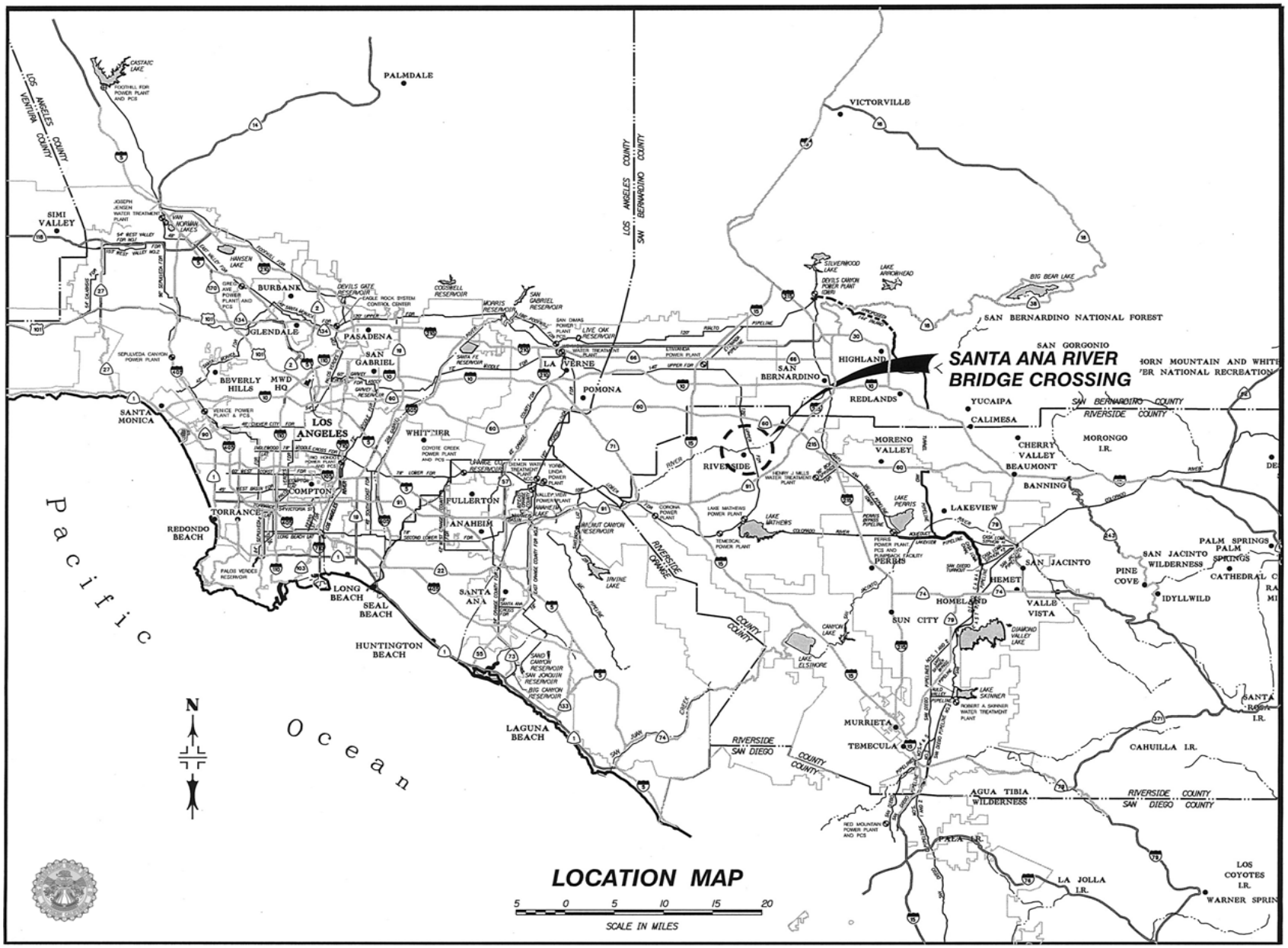
A breakdown of Board Action No. 12 for Appropriation No. 15441 is as follows:

	Previous Total Appropriated Amount (Oct. 2008)		Current Board Action No. 12 (Dec. 2008)	New Total Appropriated Amount
Labor				
Studies & Investigations	$ 545,000		$ 85,500	$ 545,000
Final Design	1,103,800	*		1,103,800
Owner Costs (Program mgmt, environmental doc.)	1,450,500		11,900	1,462,400
Construction Inspection & Support	328,500		-	328,500
Metropolitan Force Construction	3,600,000		-	3,600,000
Materials and Supplies	565,500		4,600	570,100
Incidental Expenses	422,500		-	422,500
Sewer discharge permit	60,000		-	60,000
Professional/Technical Services	389,500		3,000	392,500
Env. Mitigation Monitoring	15,000		-	15,000
Equipment Use	148,000		-	148,000
Contracts	2,286,000		-	2,286,000
Remaining Budget	1,222,700	*	-	1,222,700
Total	**$ 12,137,000**		**$ 105,000**	**$ 12,156,500**

*Reflects reallocation of $315,300 from Remaining Budget to Final Design for the Upper Feeder Gates Rehabilitation Project. This expenditure allowed staff to take measurements of facilities that are normally submerged and inaccessible during an unscheduled shutdown.

Funding Request

Program Name:	Conveyance and Distribution System Rehabilitation Program - Phase II		
Source of Funds:	Revenue Bonds, Replacement and Refurbishment or General Funds		
Appropriation No.:	15441	**Board Action No.:**	12
Requested Amount:	**$** 105,000	**Capital Program No.:**	15441-I
Total Appropriated Amount:	**$** 12,156,500	**Capital Program Page No.:**	E-15
Total Program Estimate:	**$** 19,200,000	**Program Goal:**	R-Reliability


SANTA ANA RIVER
BRIDGE CROSSING
LOCATION MAP
SCALE IN MILES
5 0 5 10 15 20
Pacific Ocean
N
PALMDALE
VICTORVILLE
SAN BERNARDINO NATIONAL FOREST
SAN GORGONIO
SIMI VALLEY
BURBANK
GLENDALE
PASADENA
SAN GABRIEL
LA VERNE
POMONA
SAN BERNARDINO
HIGHLAND
REDLANDS
YUCAIPA
CALIMESA
BEVERLY HILLS
MWD HQ
SANTA MONICA
LOS ANGELES
WHITTIER
COMPTON
TORRANCE
REDONDO BEACH
LONG BEACH
SEAL BEACH
HUNTINGTON BEACH
FULLERTON
ANAHEIM
SANTA ANA
LAGUNA BEACH
RIVERSIDE
MORENO VALLEY
CHERRY VALLEY
BEAUMONT
BANNING
LAKEVIEW
PERRIS
SAN JACINTO
HEMET
HOMELAND
VALLE VISTA
SUN CITY
MURRIETA
TEMECULA
LAKE ELSINORE
LAKE SKINNER
AGUA TIBIA WILDERNESS
CAHUILLA I.R.
PALA I.R.
LA JOLLA I.R.
LOS COYOTES I.R.
PALM SPRINGS
IDYLLWILD
PINE COVE
SAN JACINTO WILDERNESS
LOS ANGELES COUNTY
VENTURA COUNTY
SAN BERNARDINO COUNTY
RIVERSIDE COUNTY
ORANGE COUNTY
RIVERSIDE SAN DIEGO COUNTY
SAN DIEGO COUNTY

Santa Ana River Bridge and Upper Feeder